

REYNOLDS, (H. J.) with the author's
Compliments

STRICTURE

—OF—

THE URETHRA.

Urethrotomy under Cocaine Anæsthesia,

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STRICTURE OF THE URETHRA.

GENTLEMEN: The history of this case is as follows: Patient is 42 years of age; has had gonorrhœa a number of times, the discharge during several of the attacks having persisted for many months in the form of gleet. During the last two years he has been troubled very much with frequent urination, having been obliged almost invariably to rise several times during the night for that purpose. The act of urination, which required considerable time and straining, was accompanied by more or less burning pain in the urethra. About nine months ago he was examined by a physician and told that he had stricture, since which time he has been treated more or less systematically up till within three months ago by the process known as gradual dilatation, or, in other words, by the passing of sounds at regular intervals. He thinks at one time he was able to pass a No. 8 English. Since leaving off treatment his trouble has gradually grown worse, and for the past two weeks has been unable to voluntarily perform the act of urination, but is troubled with an almost constant dribbling of the urine.

As the case seems to be one undoubtedly warranting it, we will now proceed to examine systematically for stricture of the urethra.

Examination.—Most any form of urethral sound of the proper size, passed into the bladder, may be capable of detecting the mere presence of stricture, but in order to determine not only the presence of stricture, but the exact number, size and location of each, it is necessary to use what are termed *bulbous sounds*. Before proceeding with the examination, however, it will be necessary, both with a view to diagnosis and to ultimate cure, to arrive at, at least, an approximate

idea in regard to what the normal size of the urethra should be.

As a rule, to which I have never met with an exception, the urethra always bears a caliber proportionate to the size of the entire organ (Otis). For instance, in a penis measuring 3 inches in circumference (in a flaccid state) the normal urethra will generally be found to admit, if the meatus be large enough, a No. 30 French sound; a circumference of $3\frac{1}{2}$ inches would indicate a caliber of about 35 French; a circumference of 4 inches a caliber of 40 French, etc. Certain conditions may, however, without the presence of stricture, cause a slight deviation from this rule. For instance, an inflammation with more or less infiltration and thickening of the urethral structure must necessarily diminish somewhat the normal caliber. Sometimes the urethra becomes covered more or less with granulations, the same as the condition known as granular lids or trachoma. This condition, which cannot of course be regarded as *true* stricture, also somewhat diminishes the caliber of the urethra. But it is usually safe to presume that when there is a deviation of several sizes from this normal standard that some stricture exists, and therefore, though there may be no apparent obstruction to the flow of urine, if it seems to give rise to trouble in the way of gleet, or reflex urethral symptoms, demands its appropriate treatment. Many surgeons might claim that a slight amount of contraction, as indicated in this manner, would not be sufficient to demand surgical interference, but I know no reason why, if we pretend to cure or treat stricture at all, the original caliber should not be completely restored, and many reasons, not necessary at present to discuss, why it should.

To proceed, however, with the examination, we find in this case a circumference of $3\frac{3}{4}$ inches, which, according to the standard we have adopted, would indi-

cate that the normal urethra in this man's case should be about 38 French or 24 English. The object in conducting an examination with these bulbous sounds, one of which I now show you, is to use the largest one that can be made to pass all the strictures and enter the bladder. We now take a No. 24 French and find that while the bulb can be made to pass the meatus it meets with resistance on the inside. Laying this aside, and taking a No. 22 we find that it slips through the obstruction, which is about a half inch inside of the meatus, with more or less of a jerk as it passes the contraction. We have therefore ascertained that the meatus is 24 French in size, and that there is a stricture one-half inch from the meatus 22 French in size. Passing the same sound on down the urethra we find resistance at about two inches from the meatus. We now withdraw and gradually use smaller sounds till we find that a No. 17 passes through this with a jerk and meets with obstruction at about 5 inches from the meatus. We have therefore discovered another stricture at 2 inches from the meatus, which is No. 17 French in size. We now gradually try smaller instruments and find that nothing can be made to pass the obstruction at 5 inches. We have only now to resort to what are known as whalebone filiform bougies, one of which I now show you. With but very little difficulty we succeed in slipping this instrument on into the bladder. This contraction, which we locate at 5 inches, we term filiform in size. We have now succeeded in forming a satisfactorily accurate mental picture of the inside of this canal, known as the urethra, from the meatus to the bladder. I now take a No. 4 English tunneled instrument, which is however only No. 3 at the point, and tunnel it on over the filiform bougie, the latter serving as a guide for the tunneled steel instrument, and preventing what is a very common occurrence during the

passage of a very small metallic instrument if much force is used—namely, the formation of a false passage. By a little judicious manipulation we have succeeded in passing this instrument on into the bladder. Having thus satisfactorily completed our examination the question now remains, what is to be done in this case?

TREATMENT.

As there are four principal methods for treating stricture of the urethra, each having its merits in suitable cases, I may briefly enumerate and describe them. They are, (1), gradual dilatation; (2), rapid dilatation or divulsion; (3), electrolysis, or the use of the urethral electrode; (4), cutting or urethrotomy.

Gradual Dilatation.—In treating strictures by this method conical steel sounds, similar to the ones I now show you, are generally used. The largest sound that will pass through the strictures into the bladder without particular force, or causing the patient any severe discomfort, is to be passed and the same process repeated about every third day, now and then resorting to a larger instrument, as the condition of the canal seems to permit. In this way very many organic strictures of the urethra may in the course of a few months be enlarged to nearly, if not quite, their normal caliber. Some objections to this method are the slowness of the process, the repeated liability of its provoking reflex urethral troubles, such as the so-called urethral fever, prostatitis, cystitis, etc., especially if the urethra be very irritable, and the fact that in order to maintain the caliber the occasional passage of the largest sound which has been used seems to be necessary afterwards.

Divulsion.—By rapid dilatation or divulsion the strictures are ruptured or torn at one single operation by the use of an instrument, similar to the one I now show you, known as a "urethral divulser," an instrument, which, as you see, when passed into the urethra

may be expanded by various devices and made to rupture the contracted tissue. In strictures of the deep urethra the tissues, owing to their more unyielding character, may generally rupture by this process, and the effect or result then is very similar to what it would be if they had been cut. But in strictures anterior to the scrotum the tissues, instead of always rupturing during the process of divulsion, frequently stretch like india rubber, as it were, and immediately come back when the tension of the instrument is removed, leaving still some contraction, and the latter is one of the principal objections to treating strictures by this method. We have seen that it is therefore best if not only adapted to strictures of the membranous or deep urethra.

Electrolysis.—Though there are to me some very important objections to electrolysis as a scientific method of treating stricture of the urethra, it has its merits and is in suitable cases, to say the least, a very useful adjunct in the treatment of stricture. As it is a fact, however, admitted I think by even its most ardent advocates, that strictures cannot well be enlarged to more than a No. 14 or 16 English in size, by this method, it is therefore best, if not only adapted to the treatment of strictures of small caliber. In treating strictures by this method a galvanic battery, so constructed as to give the best electrolytic effect, is required. A urethral electrode, such as I now show you, which is a metallic sound insulated to within about one-half inch or so of its tip, and so arranged that it can be connected with the negative pole of the battery, and which should be several sizes larger than the stricture to be treated, is passed down and pressed against the stricture. The circuit is now completed by placing the positive electrode on some adjacent part. As to the strength of current required, no definite rule can be laid down; with the ordinary McIn-

tosh battery from eight to sixteen cells will be necessary. The electrode is now carefully and continuously pressed for several minutes, until it finally passes through the stricture, causing, during the continuance of the operation, a certain amount of stinging, burning pain. This operation is to be repeated every week or ten days, using at each time an instrument several sizes larger than at each preceding time. This, then, would complete a rather imperfect description of the method of treating strictures by electrolysis.

As to the merits of this method, it is an unquestionable fact that a larger instrument, if it contains an electrolytic current, can be passed through a much smaller passage than could be done without the current, as it seems to dissolve its way in, as it were. This I frequently see demonstrated in a very striking manner during the removal of superfluous hairs by electrolysis; when the needle, if the current be on, will pass into the tissues without any perceptible resistance. Owing, however, to the fact that with the use of a very large electrode the current becomes greatly diffused, very little electrolytic action takes place, and the effect then becomes very similar, if not the same, as from the use of an ordinary sound. It is obvious therefore that this, as a method for restoring the complete caliber of the urethra is an imperfect one. I occasionally use it, however, when I have a stricture so small that I cannot get in any other instrument, as I think it is the best method for a very fine stricture, preliminary to the rapid method of divulsion and cutting, which I always prefer ultimately to resort to, and which I shall now describe.

Internal Urethrotomy.—We now come to consider a method that is the most radical, and, according to my own judgment and experience, the best in all cases—namely, internal urethrotomy. I think the best instrument ever devised for this purpose is what is known

as the "Otis divulsing urethrotome," which may, as its name would indicate, be used for both divulsing and cutting. This instrument, which, when closed, is No. 15 French or 8 English in size, consists of two divulsing blades which may be separated when passed into the urethra to an indicated size by turning a screw at the end, and contains also in its upper surface a concealed blade. Having located the strictures and enlarged the meatus, which may be done by passing this instrument upside down until the concealed cutting blade has just passed the meatus, then separating the divulsing blade the desired extent and withdrawing the cutting blade, cutting downwards towards the frenum; the instrument then, after the divulsing blades are approximated, is passed on down until the concealed cutting blade is just past the first stricture. The divulsing blades are again separated to the desired extent, as shown by the indicator on the end of the instrument, and the blade is again withdrawn a sufficient distance to sever the strictured tissues freely, which incision in a bad case should extend at least half an inch on each side of the stricture. Turning off the tension the instrument is now passed on down and all other strictures, if any, are treated in the same manner, unless they be very deep in the urethra—the membranous portion, for instance—when a good, thorough divulsion will generally be found sufficient and less hazardous than the cutting process. The instrument is now withdrawn, when a sound, the size of what the normal urethra should be in that case, is passed into the bladder. The after treatment will consist of the passage of a full size sound at intervals of from two to four days for a few weeks, or until the parts have become fully and firmly healed.

Cocaine Anæsthesia.—Now, as to the case before us. As it is a very urgent one it necessarily demands prompt and efficient treatment. A delay in a case of

this kind, when there is almost complete obstruction to the discharge of urine, might become a very serious matter, and as we have been able to pass a very small instrument in over the filiform guide it is entirely probable that such instruments as will be required in an operation can be gotten in, and we will therefore now proceed to render the parts to be involved in the operative procedure insensible to pain by the use of cocaine. While most mucous membranes readily absorb this drug to a sufficient extent to produce anæsthesia, it is a fact that the cutaneous structures, when the drug is applied in the ordinary way, will not. We now apply, as you see, persistently for a number of minutes on absorbent cotton, a five-per-cent. solution of cocaine within and outside of the meatus with a view first to anæsthetizing these parts, but we find that, approximating a cutaneous character as these tissues do, we are as yet unable to produce any perceptible insensibility to pain, as indicated by pinching with the finger-nail around the meatus. To obviate this, which is the chief difficulty in adopting this method of anæsthesia for stricture operations, we bring to our aid the supplementary means of the galvanic current. It has been shown—on which subject I had the honor to read a paper before the American Medical Association a year ago—that by applying a cocaine solution with the positive electrode of the galvanic battery with a given strength of current, the drug would, when the circuit was completed, readily produce anæsthesia of the skin. We therefore saturate this electrode, which you see has a metallic end about three-quarters of an inch in diameter, covered with chamois skin, apply it to the meatus, connect with the positive pole, and complete a current of ten cells of this—which is the ordinary McIntosh battery—by placing the negative electrode on the thigh. This soon produces a warm sensation of the parts, and in a

few minutes we find the surface is somewhat reddened. We find that pinching with the finger-nail now produces no sensation whatever. We now take a deep urethral syringe, pass it a distance down into the urethra, compress the urethra around the instrument near the meatus, and then by carefully manipulating the under side of the organ with the fingers work the solution back and forward more or less the entire length of the urethra. This process is to be continued for five or six minutes, after which the parts will probably be sufficiently anæsthetized and we will then let the solution escape.

Operation.—As I prefer in all cases the form of treatment just described—internal urethrotomy—certainly under all circumstances, the patient having been under a more or less systematic treatment of gradual dilatation without beneficial results, I think an immediate operation of the cutting or radical kind is imperatively called for in this case. I think that such operations should as a rule, be made at the home of the patient where absolute quiet can be enforced; but as we might not again in a number of weeks be as successful in getting an instrument into the bladder as we have been to-day, we should not let the opportunity pass to make the comparatively simple operation of internal urethrotomy at once; otherwise, at a subsequent visit the parts might be so contracted that no instrument whatever could be gotten in, and the only and inevitable result would be the more formidable operation of external perineal urethrotomy. It will, however, as you are doubtless aware, be absolutely impossible to get in the instrument I have just described (Otis' divulsing urethrotome), but as the instrument known as "Thompson's Divulser" is tunneled at the end, and only about a No. 3 English in size at the tip, it is entirely probable we can slip it over this filiform bougie into the bladder, which we

will now attempt to do. We now gradually work this instrument down over the whalebone guide until we come to the filiform contraction, keeping the direction of the canal and the curve of the instrument well in our minds, and at the same time gently pressing in and retracting the filiform bougie, which thereby insures its freedom, and consequently the onward pressure in the proper direction of the instrument which is tunneled on over it. We now find after a little careful, gradual manipulation we have succeeded in entering the bladder with this Thompson's divulsor. Now removing the filiform guide we proceed to treat these strictures first by the process of divulsion; turning a screw at the end we separate the divulsing blades to their full extent. Turning off the tension we find we are unable to retract the instrument, which is accounted for by the fact that some of the mucous membrane has in all probability become engaged between the two divulsing blades. To overcome this difficulty, we slightly separate the blades again by turning the screw at the end and thereby disengage the mucous membrane, and gradually retract the instrument, at the same time turn off tension. We now divulse in the same manner the other two strictures, turning the instrument up to its full capacity.

Now, that we have treated these strictures carefully by the method of one of the most renowned genito-urinary surgeons of the age, Sir Henry Thompson, let us take the bulbous sounds and again explore the canal and ascertain what the condition is after this treatment. We have already shown that the normal caliber of this urethra should be 24 English in size, and as the full capacity of the Thompson instrument is at best only 18 or 19 English, of course according to our ideas of a radical cure of stricture it would be absolute folly to regard further operative measures unnecessary, for we find now as you can see and feel,

that while a No. 25 French bulb, which is about 15 English, can be passed through all the strictures into the bladder, it detects a decided contraction at every stricture, slipping through each one with more or less of a hitch, indicating that the contracting bands have not been completely ruptured.

We therefore now proceed with the Otis divulsing urethrotome to make the operation of internal urethrotomy by the method I have previously described, first divulsing and cutting the meatus and stricture at half an inch up to 40 French, and now the one at two inches and at five inches in the same manner. We find now by exploration that all contracting bands have been severed, and that a No. 24 sound passes readily into the bladder. This completes all operative measures at present called for, and as you observe, the operation has caused the patient absolutely no pain whatever.

The after treatment will consist in the administration of $\frac{1}{4}$ to $\frac{1}{2}$ drachm of citrate of potash, three times a day, to render the urine neutral or alkaline, and therefore less irritating, and such other internal remedies as seem to be indicated, if any—laxatives, etc.—and the passage at regular intervals of a full sized sound—24 English or 40 French. This process must be continued as previously indicated until the parts have fully and absolutely healed, which may be from one to two months. To obviate the pain which is sometimes more or less severe the first few times the sound is passed after the operation, the cocaine anæsthesia serves an admirable purpose.

I wish to bring before you two cases that were operated upon in this manner about two years ago, with a view of illustrating the permanency of the results obtained by this method of treatment.

CASE II.—The history of this case, as shown by the records of this institution, is as follows: March 29, 1886, J. S., aged 30, muscular and otherwise healthy,

has had gonorrhœa several times, and an annoying gleet for over two years. Examination reveals a stricture, No. 8 English, an inch and a half from the meatus, to three and one-half inches from the meatus; also a somewhat smaller contraction at five inches. After operation (under chloroform) a No. 22 English sound passed; sound again passed at regular intervals for two months. Patient discharged cured.

We find now, as you see, that the same sound, No. 22, passes into the bladder actually easier than it did at the time of the operation, which is over two years ago.

CASE III.—July 20, 1886, H. S., aged 28, gives a history of having been cut for a stricture about a year ago. His trouble at present is extremely difficult urination. Examination reveals stricture at five inches, which can only be passed by filiform instruments. Divulsion with Thompson's instrument, and urethrotomy with the Otis urethrotome; No. 22 sound passed after operation. Same sound passed at regular intervals for a month. We now introduce as you see the same No. 22 sound with ease into the bladder.

It may be necessary to state that in this case, while the patient says he was cut, it is probable no after treatment was kept up, and that the parts united again as they were previously.

It is further interesting in this connection to state that both of these two cases have since the operation had gonorrhœa, and were treated under my observation. These are only two of scores of cases which serve to forcibly illustrate the value of the operative procedure we have just considered.



